

NPF-38-195

ATTACHMENT A

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## INSTRUMENTATION

### CHEMICAL DETECTION SYSTEMS

#### BROAD RANGE GAS DETECTION

#### LIMITING CONDITION FOR OPERATION

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3.3.3.7.3 Two independent broad range gas detection systems shall be operable with their alarm/trip setpoints adjusted to actuate at the lowest achievable IDLH gas concentration level of detectable toxic gases\* providing reliable operation.

APPLICABILITY: All MODES.

ACTION:

- a. With one broad range gas detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room ventilation system in the isolate mode of operation.
- b. With no broad range gas detection system OPERABLE, within 1 hour initiate and maintain operation of the control room ventilation system in the isolate mode of operation.
- c. The provisions of Specification 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.3.3.7.3 Each broad range gas detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK at least once per 12 hours, a CHANNEL FUNCTIONAL TEST at least once per 31 days and a channel calibration at least once per 7 days. Calibration will consist of the introduction of a standard gas and adjusting the instrument sensitivity based on the calibration gas relationship of the standard gas to the calibrating gas.

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\*Including Ammonia

## INSTRUMENTATION

### BASES

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#### 3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION

The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Plants to Assess Plant Conditions During and Following an Accident," December 1980 and NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations." Table 3.3-10 includes Regulatory Guide 1.97 Category I key variables. The remaining Category I variables are included in their respective specifications.

The Subcooled Margin Monitor (SMM), the Heated Junction Thermocouple (HJTC), and the Core Exit Thermocouples (CET) comprise the Inadequate Core Cooling (ICC) instrumentation required by Item II.F.2 NUREG-0737, the Post TMI-2 Action Plan. The function of the ICC instrumentation is to enhance the ability of the plant operator to diagnose the approach to existence of, and recovery from ICC. Additionally, they aid in tracking reactor coolant inventory. These instruments are included in the Technical Specifications at the request of NRC Generic Letter 83-37. These are not required by the accident analysis, nor to bring the plant to Cold Shutdown.

In the event more than four sensors in a Reactor Vessel Level channel are inoperable, repairs may only be possible during the next refueling outage. This is because the sensors are accessible only after the missile shield and reactor vessel head are removed. It is not feasible to repair a channel except during a refueling outage when the missile shield and reactor vessel head are removed to refuel the core. If only one channel is inoperable, it should be restored to OPERABLE status in a refueling outage as soon as reasonably possible. If both channels are inoperable, at least one channel shall be restored to OPERABLE status in the nearest refueling outage.

#### 3/4.3.3.7 CHEMICAL DETECTION SYSTEMS

The chemical detection systems are the chlorine and broad range toxic gas detection systems.

The OPERABILITY of the chemical detection systems ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chemical release.

The chemical detection systems provide prompt detection of toxic gas releases which could pose an actual threat to safety of the nuclear power plant or significantly hamper site personnel in performance of duties necessary for the safe operation of the plant.

The broad range toxic gas detection system operates on the principle of gas photoionization, and therefore, the system is sensitive to a broad range of gases.\* The system is therefore sensitive to both atmospheric and chemical composition normal fluctuations affecting the Waterford 3 site. The setpoint

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\*Including Amononia

## INSTRUMENTATION

### BASES

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for the system is thus based on testing and operating experience, and the setpoint is set at the lowest achievable IDLH gas concentration providing reliable operation and the optimum detection of toxic gases. The setpoint is therefore subject to change wherein necessitated by operating experience such as a result of changes in the Waterford 3 area chemical atmospheric profile. The setpoint is established and controlled by procedure.

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3/4.3.3.9 This section deleted

NPF-38-195

ATTACHMENT B

## INSTRUMENTATION

### CHEMICAL DETECTION SYSTEMS

#### BROAD RANGE GAS DETECTION

#### LIMITING CONDITION FOR OPERATION

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3.3.3.7.3 Two independent broad range gas detection systems shall be OPERABLE \*\* with their alarm/trip setpoints adjusted to actuate at the lowest achievable Immediately Dangerous to Life or Health gas concentration level of detectable toxic gases \* providing reliable operation.

APPLICABILITY : All MODES.

ACTION: \*\*

- a. With one broad range gas detection system inoperable, restore the inoperable detection system to OPERABLE status within 7 days or within the next 6 hours initiate and maintain operation of the control room ventilation system in the isolate mode of operation.
- b. With no broad range gas detection system OPERABLE, within 1 hour initiate and maintain operation of the control room ventilation system in the isolate mode of operation.
- c. The provisions of Specification 3.0.4 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.3.3.7.3 Each broad range gas detection system shall be demonstrated OPERABLE by performance of a CHANNEL CHECK at least once per 12 hours and a CHANNEL FUNCTIONAL TEST at least once per 31 days. The CHANNEL FUNCTIONAL TEST will include the introduction of a standard gas.

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\* Including Ammonia

\*\* The requirements of Technical Specification 3.0.1 do not apply during the time (approximately one minute) when the Instrument automatic background/reference spectrum check renders the instrument(s) inoperable

## INSTRUMENTATION

### BASES

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#### 3/4.3.3.6 ACCIDENT MONITORING INSTRUMENTATION

The OPERABILITY of the accident monitoring instrumentation ensures that sufficient information is available on selected plant parameters to monitor and assess these variables following an accident. This capability is consistent with the recommendations of Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Plants to Assess Plant Conditions During and Following an Accident," December 1980 and NUREG-0578, "TMI-2 Lessons Learned Task Force Status Report and Short-Term Recommendations." Table 3.3-10 includes Regulatory Guide 1.97 Category I key variables. The remaining Category I variables are included in their respective specifications.

The Subcooled Margin Monitor (SMM), the Heated Junction Thermocouple (HJTC), and the Core Exit Thermocouples (CET) comprise the Inadequate Core Cooling (ICC) instrumentation required by Item II.F.2 NUREG-0737, the Post TMI-2 Action Plan. The function of the ICC instrumentation is to enhance the ability of the plant operator to diagnose the approach to existence of, and recovery from ICC. Additionally, they aid in tracking reactor coolant inventory. These instruments are included in the Technical Specifications at the request of NRC Generic Letter 83-37. These are not required by the accident analysis, nor to bring the plant to Cold Shutdown.

In the event more than four sensors in a Reactor Vessel Level channel are inoperable, repairs may only be possible during the next refueling outage. This is because the sensors are accessible only after the missile shield and reactor vessel head are removed. It is not feasible to repair a channel except during a refueling outage when the missile shield and reactor vessel head are removed to refuel the core. If only one channel is inoperable, it should be restored to OPERABLE status in a refueling outage as soon as reasonably possible. If both channels are inoperable, at least one channel shall be restored to OPERABLE status in the nearest refueling outage.

#### 3/4.3.3.7 CHEMICAL DETECTION SYSTEMS

The chemical detection systems are the chlorine and broad range toxic gas detection systems.

The OPERABILITY of the chemical detection systems ensures that sufficient capability is available to promptly detect and initiate protective action in the event of an accidental chemical release.

The chemical detection systems provide prompt detection of toxic gas releases which could pose an actual threat to safety of the nuclear power plant or significantly hamper site personnel in performance of duties necessary for the safe operation of the plant.

The broad range toxic gas detection system utilizes a Fourier Transform Infrared (FTIR) analysis technique, and therefore, the system is sensitive to a broad range of gases\*. The system is sensitive to normal fluctuations of both atmospheric and chemical composition which affect the Waterford 3 site. The setpoints

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\* Including Ammonia



## INSTRUMENTATION

### BASES

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associated with the system are based on testing and operating experience. Set-points are set as to prevent Immediately Dangerous to Life or Health (IDLH) gas concentration in the control room while providing reliable operation and the optimum detection of toxic gases. The setpoint is therefore subject to change wherein necessitated by operating experience such as a result of changes in the Waterford 3 area chemical atmospheric profile. The setpoint is established and controlled by procedure.

The LCO and ACTIONS for the broad range gas detection system are annotated such that the system instrument automatic background/reference spectrum check does not constitute system inoperability if both channels are operable and both channels are not performing the check simultaneously. The instrument automatically performs this check. During the time that the automatic background/reference spectrum check is taking place (which will be less than one minute), the channel will not perform the function of isolation of the control room. With both channels OPERABLE, the other system will be available to perform the control room isolation function in the event of a toxic gas incident. With one channel taken out of service (e.g., for maintenance), when the second channel performs the automatic background check, both channels will be unable to perform the function of isolating the control room for the short time of the background check. Analysis has shown that the impact on operator incapacitation and subsequent core damage risk of the background checks while one monitor is out of service for its 7 day allowed outage time is negligible. Therefore, entry into the ACTION solely due to the automatic check is not required.

No specific manual CHANNEL CALIBRATION is required as the system instrument performs this function as the background/reference spectrum check automatically for approximately one minute on a frequency of once every hour to once every four hours. The exact frequency is established based on operating experience with the instrument.

The performance of the CHANNEL CHECK once every 12 hours ensures that a gross failure of the instrument has not occurred. The CHANNEL CHECK consists of a comparison of the display of the standard gas (utilized in the FUNCTIONAL TEST), CO2 and water. Significant deviations from the expected readings and actual readings could be an indication of a malfunction within the unit. The CHANNEL CHECK will detect gross system failure; thus, it is the key to verifying the instrument continues to operate properly between each CHANNEL FUNCTIONAL TEST.

A CHANNEL FUNCTIONAL TEST is performed to ensure the entire channel will perform its required function. This test includes introduction of a standard gas and verification of isolation of the control room. The time of the occurrence of the background/reference spectrum check is set during the CHANNEL FUNCTIONAL TEST such that both channels are not out of service simultaneously.

3/4.3.3.8 THIS SECTION DELETED

3/4.3.3.9 THIS SECTION DELETED